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09/858,099	05/15/2001	Anthony Mazzurco	135815	4803

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EXAMINER	
MOORE, IAN N	
ART UNIT	**PAPER NUMBER**
2661	

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)
	09/858,099	MAZZURCO ET AL.
	Examiner	**Art Unit**
	Ian N. Moore	2661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ~~9-10-05~~. 7-06-05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1,2,13,14, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nathan (US005870212A) in view of Li (US006414765B1).

Regarding claim 1, Nathan discloses a communications network comprising (see FIG. 8, optical network):

a pair of network elements (see FIG. 8, Nodes A and D);

two or more working spans (see FIG. 8, two working channels/spans 858 W and 862 W; see col. 3, lines 45-49; note that "channel" or "span" refers to any type of optical link for transporting optical signal between two points) coupled between said pair of network elements for carrying communication traffic between said pair of network elements (see FIG. 8, working span 858 carries working traffic for optical ring/network 802 between node A and D, and working span 862 carries working traffic for optical ring/network 804 between node A and D),

each working span carrying said communication traffic over a plurality of channels associated with one or more rings (see FIG. 8, each working channel/span 858 or 862 carries an optical signal which consists of plurality channels from line termination equipments LTs

(i.e. 806,808,846,848, 856, 854, etc.), also see FIG. 6 and 7; see col. 6, lines 51 to col. 7, lines 25);

a shared protection span (see FIG. 8, Spare channel/span 860 S) coupled been said network elements (see FIG. 8, Spare channel/span 860 connects Nodes A and D), said shared protection span providing a plurality of channels (see FIG. 8, a spare channel/span 860 also carries an optical signal which consists of plurality channels/wavelengths/signals from line termination equipments LTs (i.e. 806,808,846,848, 856, 854, etc.) when a failure occurs in the network(s), also see FIG. 6 and 7; see col. 6, lines 51 to col. 7, lines 25);

wherein said network elements include circuitry (see FIG. 9, OCCS CTRLR 850 or 840, optical cross-connect system controller; or FIG. 3, OCCS CTRLR 209) for switching communication traffic on rings associated with different working spans (see FIG. 9, optical ring/network 802, associated with working span/channel 858, and ring/network 804, associated with working spand862, are different working spans/channels) to respective channels of said shared protection span (see FIG. 9, upon detection a failure between node A and B, the OCCS CTRLR switches the LT signal/traffic to the respective wavelengths/signals/channels of the standby span/channel. Note that OCCS CTRLR 850 switches LT signal to its respective signal/channel on the spare span/channel, and OCCS CTRLR 840 also switches LT signal to its respective signal/channel on the spare span/channel; see col. 7, lines 25 to col. 8, lines 19).

Nathan does not explicitly disclose concurrently and respective channels of said span. However, Li teaches switching circuitry (see FIG. 4B, protection switch 10) for concurrently coupling channels to respective channels of said shared protection span (also see FIG. 4A;

col. 6, line 60 to col. 7, line 16; note that protection switch supports the protection of each channel wavelength for concurrent switching). Note that Nathan system teaches a shard protection of multi-wave length channels (i.e. protection at "line level" in optical networking) for protecting two working spans of two rings. Li discloses a shared protection switch for protection each wavelength (i.e. protection at "path level" in optical networking), so that more than one wavelength channel can be protected at the same time or "concurrently". Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide protection switch that is capable of protection more than one channel at the same time, as taught by Li in the system of Nathan, so that it would provide protection for both multi-channel and single channel failures; see Li col. 1, line 56 to col. 2, line 4.

Regarding claim 2, Nathan further teaches wherein at least one of said working spans (see FIG. 8, working spans/lines/fibers 858 W, 862 W) carries traffic for multiple ring structure (see FIG. 8, optical networks/rings 802 and 804; note that since node A and node D interconnect two rings networks 802 and 804, each working span/lines/channel carries the traffic signals from both networks/rings for those signals which are added from one network/ring (i.e. LT 806 of ring 802) and dropped at another network/ring (i.e. LT 866 of ring 804); see col. 6, lines 50 to col. 7, lines 40).

Regarding claim 13, Nathan discloses a network element (see FIG. 8, Node A) comprising:

Interface circuitry (see FIG. 8, Interface circuit of node A), for coupling to two or more incoming working spans (see FIG. 8, two incoming working span/lines/channels 814 W

and 864 W) and two or more respective incoming protection spans (see FIG. 8, two incoming standby span/lines/channels 816 S and 866 S), each of said working spans operable to carry communications traffic over a plurality of channels associated with one or more rings (see FIG. 8, working span 814 carries working traffic for optical ring/network 802, and working span 864 carries working traffic for optical ring/network 804); and

switching circuitry (see FIG. 8, Switching circuit of node A) coupling channels from different incoming protection spans (see FIG. 8, protection spans/channels 816 S and 866 S; see col. 7, lines 25 to col. 8, lines 19) to a shared protection span (see FIG. 8, Spare channel/span 860 S; note that a signal spare channel/span 860 S connects the plurality channels/wavelengths/signals from line termination equipments LTs (i.e. 806,808,846,848, 856, 854, etc.) utilized by two ring networks protection/spare channels/spans 816 and 866 between node A and D; also see FIG. 6 and 7; see col. 6, lines 51 to col. 7, lines 25. Also, in FIG. 9, when 864 W working channel/span fails, the traffic switches over to spared channel/span 866 S, and 866 S is actively transporting the traffic. When both 864 W and 866 S spans/channels fail, the traffic on 866 S is switched over to shared spared span/channel 860 S).

Nathan does not explicitly disclose concurrently coupling. However, Li teaches switching circuitry (see FIG. 4B, protection switch 10) for concurrently coupling channels to a shared protection span (also see FIG. 4A; col. 6, line 60 to col. 7, line 16; note that protection switch supports the protection of each channel wavelength for concurrent switching). Note that Nathan system teaches a shard protection of multi-wave length channels (i.e. protection at "line level" in optical networking) for protecting two working

spans of two rings. Li discloses a shared protection switch for protection each wavelength (i.e. protection at "path level" in optical networking), so that more than one wavelength channel can be protected at the same time or "concurrently". Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide protection switch that is capable of protection more than one channel at the same time, as taught by Li in the system of Nathan, so that it would provide protection for both multi-channel and single channel failures; see Li col. 1, line 56 to col. 2, line 4.

Regarding claim 14, Nathan discloses for selective switching a channel from an incoming protection span (see FIG. 9, a LT channel/signal/traffic over the spared channel/span/line 866 S) to an available channel of said shared protection span (see FIG. 9, one of the available channels over the shared spared channel/span/line 860. Note that when 864 W working channel/span fails, the traffic switches over to spared channel/span 866 S, and 866 S is actively transporting the traffic. When both 864 W and 866 S spans/channels fail, the traffic on spared 866 S is switched over to shared spared span/channel 860 S; see col. 7, lines 20 to col. 8, lines 45) responsive to control information (see col. 5, lines 30 to col. 6, lines 51; a failure indication transmitted by LT). Li also discloses wherein said switching circuitry includes control circuitry (see FIG. 5, Control 80 of protection switch 10) for selectively switching a channel from an incoming protection span to an available channel of said shared protection span responsive to control information (see col. 7, line 4-40).

Regarding claim 16 and 17, Nathan discloses said interface circuitry includes a channel multiplexer and demultiplexer (see FIG. 7, WDM 702,708, 706, 714, and etc.; wave division multiplexer see col. 4, line 65 to col. 5, lines 6; see col. 6, lines 52-67; note that if

there is multiplexer, there must also be demultiplexer). Li also discloses channel multiplexer and demultiplexer (see FIG. 2B or 4B; see col. 5, line 14-35; see col. 7, line 19-40).

3. Claims 3-7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nathan and Li, as applied to claim 1 and 13 above, and further in view of Lin (U.S. 6,785,438).

Regarding claims 3 and 15, Nathan discloses wherein said pair of network elements each includes an optical matrix (see FIG. 2 and 8, Nodes in the network are optical cross connect switches (OCCS) which includes an optical cross connects/matrix; see col. 4, line 5-19). Li also discloses an optical matrix (see FIG. 4B, a combined system of interface Tx and Rx, add/drop mux/demux 140,142,160,162).

Neither Nathan nor Li explicitly discloses non-blocking. However, the above-mentioned claimed limitations are taught by Lin. In particular, Lin teaches a non-blocking optical matrix (see FIG. 7, non-blocking switching core; see col. 7, line 39-60).

In view of this, having the combined system of Nathan and Li, then given the teaching of Lin, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Nathan and Li, by providing non-blocking optical switch core, as taught by Lin. The motivation to combine is to obtain the advantages/benefits taught by Lin since Lin states at col. 1, line 55-65 that such modification would significantly reduce the number of switches that are required to construct the switch core.

Regarding claim 4, Nathan further teaches wherein each of said pair of network elements (see FIG. 8, Node A or Node D) is coupled to two or more incoming working spans

(see FIG. 8, Node A is coupled to two incoming working spans/channels 814W and 864 W; node D is coupled to two incoming working spans/channels 832 W and 890 W) and two or more corresponding incoming protection spans (see FIG. 8, Node A is coupled to two incoming spare spans/channels 816 S and 866 S; node D is coupled to two incoming working spans/channels 830 S and 888 S).

Regarding claim 5, Nathan further teaches wherein each of said pair of network elements includes control circuitry (see FIG. 9, OCCS CTRLR 850, see FIG. 3, OCCS CTRLR 209 which performs the switching) for switching a channel from each of said incoming protection spans (see FIG. 9, a LT channel/signal/traffic over the spared channel/span/line 866 S) to an available channel of said shared protection span (see FIG. 9, one of the available channels over the shared spared channel/span/line 860. Note that when 864 W working channel/span fails, the traffic switches over to spared channel/span 866 S, and 866 S is actively transporting the traffic. When both 864 W and 866 S spans/channels fail, the traffic on 866 S is switched over to shared spared span/channel 860 S; see col. 7, lines 20 to col. 8, lines 45).

Regarding claim 6, Nathan further teaches wherein each of said pair of network elements includes control circuitry (see FIG. 9, OCCS CTRLR 850, see FIG. 3, OCCS CTRLR 209 which performs the switching) for switching a channel from each of said incoming working spans (see FIG. 9, a LT channel/signal/traffic over the spared channel/span/line 866 S) to said shared protection span (see FIG. 9, one of the available channels over the shared spared channel/span/line 860. Note that when 864 W working channel/span fails, the traffic switches over to spared channel/span 866 S, and 866 S is

actively transporting the traffic. When both 864 W and 866 S spans/channels fail, the traffic on 866 S is switched over to shared spared span/channel 860 S. Thus, it is clear that OCCS CTRLR switches a LT channel/signal/traffic from working span/channel 864 W to shared spared span/channel 860 S; see col. 7, lines 20 to col. 8, lines 45).

Regarding claim 7, Nathan further teaches wherein each of said pair of network elements includes control circuitry (see FIG. 9, OCCS CTRLR 850 and 840, see FIG. 3, OCCS CTRLR 209 which performs the switching) for switching a channel from said shared protection span (see FIG. 9, a LT channel/signal/traffic over the shared spared channel/span/line 860 S) to a channel on an outgoing protection span (see FIG. 9, the original channel over the spared channel/span/line 866. Note that when 864 W working channel/span fails, the traffic switches over to spared channel/span 866 S, and 866 S is actively transporting the traffic. When both 864 W and 866 S spans/channels fail, the traffic on 866 S is switched over to shared spared span/channel 860 S. Thus, OCCS CTRLR 840 switches the traffic/signal/channel from shared spared span/channel 860 S to an outgoing protection span/channel 888 S; see col. 7, lines 20 to col. 8, lines 45).

4. Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nathan (U.S. 5,870,212) in view of Li, and further in view of Fee (U.S. 6,735,39).

Regarding claim 8, Nathan discloses a method of communication information in a communications network (see FIG. 8, optical network), comprising the steps of:

passing communications traffic between a pair of network elements (see FIG. 8, transmission of traffic/signals between Nodes A and D), where the pair of network elements

are coupled by two or more working spans (see FIG. 8, two working channels/spans 858 W and 862 W; see col. 3, lines 45-49; note that "channel" or "span" refers to any type of optical link for transporting optical signal between two points)

each carrying communications traffic between the pair of network elements over a plurality of channels associated with one or more rings (see FIG. 8, working span 858 carries working traffic for optical ring/network 802 between node A and D, and working span 862 carries working traffic for optical ring/network 804 between node A and D) and

by a shared protection span (see FIG. 8, Spare channel/span 860 S) supporting a plurality of channels over which communication traffic may be passed (see FIG. 8, a spare channel/span 860 also carries an optical signal which consists of plurality channels/wavelengths/signals from line termination equipments LTs (i.e. 806,808,846,848, 856, 854, etc.) when a failure occurs in the network(s), also see FIG. 6 and 7; see col. 6, lines 51 to col. 7, lines 25);

in the event of failures in channels associated with a ring associated with different working spans (see FIG. 9, a failure of traffic/signs associated with the optical network/ring 804 occurs between Nodes A and B), transferring communication traffic associated with a rings (see FIG. 9, optical ring/network 802, associated with working span/channel 858, and ring/network 804, associated with working spand862, are different working spans/channels) over said shared protection span (see FIG. 9, upon detection a failure between node A and B, the OCCS CTRLR switches the LT signal/traffic to the respective wavelengths/signals/channels of the standby span/channel. Note that OCCS CTRLR 850 switches LT signal to its respective signal/channel on the spare span/channel, and OCCS

CTRLR 840 also switches LT signal to its respective signal/channel on the spare span/channel; see col. 7, lines 25 to col. 8, lines 19).

Nathan does not explicitly disclose concurrently transferring. However, Li teaches switching circuitry (see FIG. 4B, protection switch 10) for concurrently coupling channels to a shared protection span (also see FIG. 4A; col. 6, line 60 to col. 7, line 16; note that protection switch supports the protection of each channel wavelength for concurrent switching). Note that Nathan system teaches a shard protection of multi-wave length channels (i.e. protection at "line level" in optical networking) for protecting two working spans of two rings. Li discloses a shared protection switch for protection each wavelength (i.e. protection at "path level" in optical networking), so that more than one wavelength channel can be protected at the same time or "concurrently". Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide protection switch that is capable of protection more than one channel at the same time, as taught by Li in the system of Nathan, so that it would provide protection for both multi-channel and single channel failures; see Li col. 1, line 56 to col. 2, line 4.

Neither Nathan nor Li explicitly disclose failures in two or more rings. However, the above-mentioned claimed limitations are taught by Fee. In particular, Fee teaches in the event of failures in channels associated with two or more rings associated with different working spans (see FIG. 6, a first failure of LTE traffic/signals between OCCS B and D, and a second failure of LTE traffic/signals between OCCS B and C), concurrently transferring communication traffic associated with each of said two or more rings (see FIG. 6, first network consists of nodes A, B, C, and K, and the second network consists of nodes B, C,

and D) over said shared protection path (see FIG. 6, an end-to-end spare path consists of 315 S,506 S, 316 S, and 308S; see col. 6, line 51 to col. 7, lines 7; see col. 5, lines 50-67).

In view of this, having the combined system of Nathan and Li and then given the teaching of Fee, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Nathan and Li, by detecting failures in two or more rings and transferring the traffic to an end-to-end spared path, as taught by Fee. The motivation to combine is to obtain the advantages/benefits taught by Fee since Fee states at col. 1, line 53 to col. 2, lines 55 that such modification would provide a network design that exhibits the simplicity and fast switching of ring network yet offers the spare efficiency and ease of growth characteristic.

Regarding claim 9, Nathan further teaches passing communication traffic over two or more working spans (see FIG. 8, two working spans/lines/fibers 858 W, 862 W), where at least one of said working spans (see FIG. 8, working spans/lines/fibers 858 W or 862 W) carries traffic for multiple ring structures (see FIG. 8, optical networks/rings 802 and 804; note that since node A and node D interconnect two rings networks 802 and 804, each working span/lines/channel carries the traffic signals from both networks/rings for those signals which are added from one network/ring (i.e. LT 806 of ring 802) and dropped at another network/ring (i.e. LT 866 of ring 804); see col. 6, lines 50 to col. 7, lines 40).

Regarding claim 10, Nathan discloses wherein said pair of network elements each includes an optical matrix (see FIG. 2 and 8, Nodes in the network are optical cross connect switches (OCCS) which includes an optical cross connects/matrix; see col. 4, line 5-19). Li also discloses an optical matrix (see FIG. 4B, a combined system of interface Tx and Rx,

add/drop mux/demux 140,142,160,162). Fee discloses non-blocking (see FIG. 1, optical cross connect switches with protection/redundant scheme for seamless switching, thereby, non-blocking the working traffic; see col. 4, line 5-12; 60-67).

In view of this, having the combined system of Nathan and Li and then given the teaching of Fee, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Nathan and Li, by seamless switching scheme/cross-connection, as taught by Fee for the same motivation as stated above in claim 8.

Regarding claim 11, Nathan further teaches receiving communications traffic from a plurality of incoming protection spans (see FIG. 8, Node A is coupled to two incoming spare spans/channels 816 S and 866 S; node D is coupled to two incoming working spans/channels 830 S and 888 S; see col. 7, lines 25 to col. 8, lines 19; thus, each Node A or D is receiving the LT traffic/signals from incoming two spared spans/channels).

Regarding claim 12, Nathan further teaches transmitting communications traffic (see FIG. 9, OCCS CTRLR 850 and 840, see FIG. 3, OCCS CTRLR 209 which performs the switching) from said shared protection span (see FIG. 9, a LT channel/signal/traffic over the shared spared channel/span/line 860 S) to two or more outgoing protection spans (see FIG. 9, the original channel over the spared channel/span/line 888 S and 876 S. Note that when 864 W working channel/span fails, the traffic switches over to spared channel/span 866 S, and 866 S is actively transporting the traffic. When both 864 W and 866 S spans/channels fail, the traffic on 866 S is switched over to shared spared span/channel 860 S. Thus, OCCS CTRLR switches the traffic/signal/channel from shared spared span/channel 860 S to two

outgoing protection span/channel 888 S and 876 S in order to reach the destination node B; see col. 7, lines 20 to col. 8, lines 45).

Response to Arguments

5. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N. Moore whose telephone number is 571-272-3085. The examiner can normally be reached on 9:00 AM- 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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9/10/05

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